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Problem-based Learning and Thinking Style Impact on Information Literacy Skill Improvement among Islamic Education Department Students

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Abstract: The information literacy skill in Islamic Education is very important for students to achieve learning goals. Therefore, this research aims to analyze the impact of the problem-based learning model's implementation and thinking styles on information literacy skill improvement among Islamic Education Department students. This is a quasi research with data collected through test instruments as well as questionnaires, and then analyzed descriptively and inferentially. Furthermore, the data processing results of information literacy skills and thinking styles were based on the SPSS v.25 programs using two-way analysis of variance with different cells. Based on the analysis of the differences in two ways, the following were obtained (1) p-value = 0.0000 <α = 0.05, therefore H_{0A} was rejected, hence there is an influence of the learning model on information literacy skills, (2) p-value = 0.0000 < α = 0.05, therefore H_{0B} was rejected, and it is found that there is an influence of thinking style on information literacy skills, (3) there is no relationship between learning models and thinking styles on information literacy skills.

Keywords: information literacy skills, problem-based learning models, thinking styles

INTRODUCTION

Uno (2018) stated that the most important element in learning is the objective because it is the starting point for determining success. To achieve this, various strategies need to be adopted in accordance with the learning objectives. According to preliminary studies, learning is a two-way communication process in which the lecturer executes the task of teaching and educating, while the students embrace the knowledge. It is not just a reflection of information, rather its influence on the students' mental ability is also extremely relevant. Generally, learning implementation is carried out using a simple (conventional) method with the lecturer as the main source. However, minimal students' participation implies an unattractive learning environment. The lecturers' mere presentation and demonstration are not enough to produce the effective teaching. Therefore, to produce excellent outcomes, teachers are expected to carry out learning processes comfortably and effectively to ensure students participate adequately. According to Article 3 of the Law on Education System in Indonesia, support from national education aims to produce well behaved, knowledgeable, independent, healthy, creative, competent, and responsible students (Sutarto, 2017). Islamic Education is important because it guides students to develop noble behavior. Therefore it needs to be considered, and the information obtained is fully conveyed to the students.

Islamic Education is defined as an effort to instill comprehensive knowledge and understanding of Islam in students (Minarti, 2013). It is a form of learning based on the Al-Qur'an and Al-hadith (Partono, 2020). Islamic education is not only focused on cognitive theory, it also helps students to make certain decisions based on the values of Islamic law (Syamsu S, 2015). This type of education also functions as a means of guiding the body and spirit as well as developing a noble personality (Yaman & Gultom, 2017). Islamic education aims to nurture humans, thereby causing them to thoroughly (*kaffah*), understand the values contained in the Islamic law practiced daily (Ahmad *et al.,* 2015). This type of learning has the same mission at each educational level, namely to produce knowledgeable human beings with a noble character (Marzuki, 2010). Subsequently, because Islamic education is

important, every activity needs to be carefully analyzed thinking, thereby making it easy for the students to understand and practice the knowledge instilled. In addition to the role of lecturers in designing learning activities, students need to develop the ability to critically acquire, sort, and select information properly. This is known as information literacy skills (Grassian & Kaaplowitz, 2009).

Information literacy is one of the potentials that every student needs to embrace. This is because there is an influx of information in the current era, although some are unreliable. Information literacy is also referred to as a process to develop an independent attitude, thereby causing students to be sensitive to its importance. In addition, the students are also able to acquire and filter information according to their needs (Anwar, Rizal et al. Saepudin, 2015). It is also described as the integration of the skill related to obtaining information, understanding, and appreciating its usage, thereby affecting the learning system and producing new knowledge (Dolničar *et al.*, 2020; Moreno-Morilla, Guzmán-Simón & García-Jiménez, 2021). Therefore, information literacy is recognized as an empowerment tool that shapes students to develop the skills and competencies needed to become informed and actively contribute as well as participate in community and society activities (De Paor & Heravi, 2020). However, information literacy is also defined as a set of abilities that enables students to identify specific information needs or goals, search, evaluate, organize, analyze and synthesize its sources, which are used to serve certain purposes, as well as adjust and validate its objectives and processes (Karim & Noor, 2020).

Students that already possess information literacy skills are able to solve certain problems and communicate appropriately. Information literacy is extremely relevant in this globalization era because participating in competitive activities relies on intelligence, including learning and communicating with other people, which are also of great consideration (Lien et al., 2020). Due to the importance of these skills, teachers tend to pay attention to certain needs of student, which positively influences their learning literacy. The learning model selection needs to be considered to improve students' literacy skills.

RESULTS AND DISCUSSION

Result

As earlier stated, the purpose of this research is to analyze the impact of problem-based learning models and thinking styles on information literacy abilities associated with Islamic Education. Therefore, the acquired data are the results of Islamic education learning pre and post-test by applying the learning models. In addition, the hypothesis was statistically proven using the SPSSv.25 program. Based on the pretest and post-test results on the data collection, the N-Gain value was calculated to determine the improvement of students' information literacy abilities pre and post the execution of the learning process. The summary of the results realized using the N-Gain value to calculate the information literacy ability of the experimental and control classes with a learning model based on problems and a conventional method is shown in the following table.

Figure 1: Observing Data Description of the N-Gain value on Information Literacy Ability

Statistics

		Experimental Information Literacy	Control Information Literacy
N	Valid	30	30
	Missing	0	0
Mean		,6067	,4860
Std. Error of Mean		,03489	,02430
Median		,5850	,5000
Mode		,40[a]	,50
Std. Deviation		,19108	,13307
Variance		,037	,018
Range		,75	,57
Minimum		,25	,14
Maximum		1,00	,71
Sum		18,20	14,58

a. Multiple modes exist. The smallest value is shown

The N-Gain data description table shows an increase in the student information literacy skills mean of the experimental class, which is 0.6067 with a median value of 0.5850 and 0.40, respectively. Meanwhile, in the control class, an increase by 0.4860 was detected in the information literacy skills with median values of 0.5000 and 0.5, respectively. The minimum increase in the experimental and control classes were 0.25, and 0.14 respectively. The maximum increase in the experimental and control classes obtained a value of 1.00, and 0.71 respectively. Based on this analysis, it was concluded that there was an improvement in the experimental class due to the application of problem-based learning models compared to the control. This is evident in the comparison between the mean and the highest score obtained by each sample class.

The data obtained are consistent with the requirements and in accordance with the normality and homogeneity prerequisites, of a diverse and slightly different population. However, after fulfilling the prerequisite test phase for normality and homogeneity as well as calculating the N-Gain value, the next process is hypothesis testing. This is based on the N-Gain calculation data, which depends on each treatment model of students' learning and thinking styles. Furthermore, the results of the hypothesis test for the 2 cell methods are shown in table 2.

Figure 2: Calculation Results of Two Way N-Gain Variance Analysis

Tests of Between-Subjects Effects

Dependent Variable: N Gain

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	1,031[a]	7	,147	10,081	,000

Intercept	18,009	1	18,009	1232,591	,000
Class	,259	1	,259	17,745	**,000**
Thinking_style	,723	3	,241	16,498	**,000**
Class * Thinking_style	,073	3	,024	1,657	**,188**
Error	,760	52	,015		
Total	19,700	60			
Corrected Total	1,791	59			

a. R Squared = ,576 (Adjusted R Squared = ,519)

Consequently, after analyzing the 2 different cell methods, a double comparative test aims to determine which treatment provides a significant difference in increasing the potential for student information literacy. The marginal mean was obtained based on the results of the 2-way difference analysis. The difference in the average N-Gain value of information literacy skills based on the treatment of the learning model and students' thinking styles is shown in the following diagram.

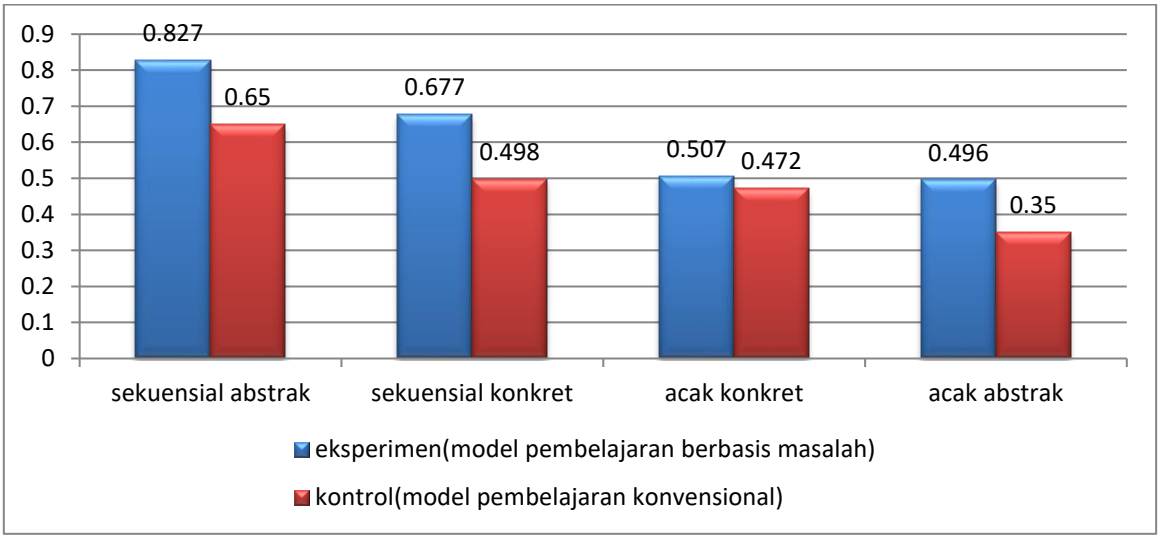

Figure 3: The Difference of Mean N-Gain Value on Information Literacy Ability Diagram

The mean test results after comparing the treatment for each indicator of students' information literacy skills with the conventional problem-based learning model are shown in Table 4.

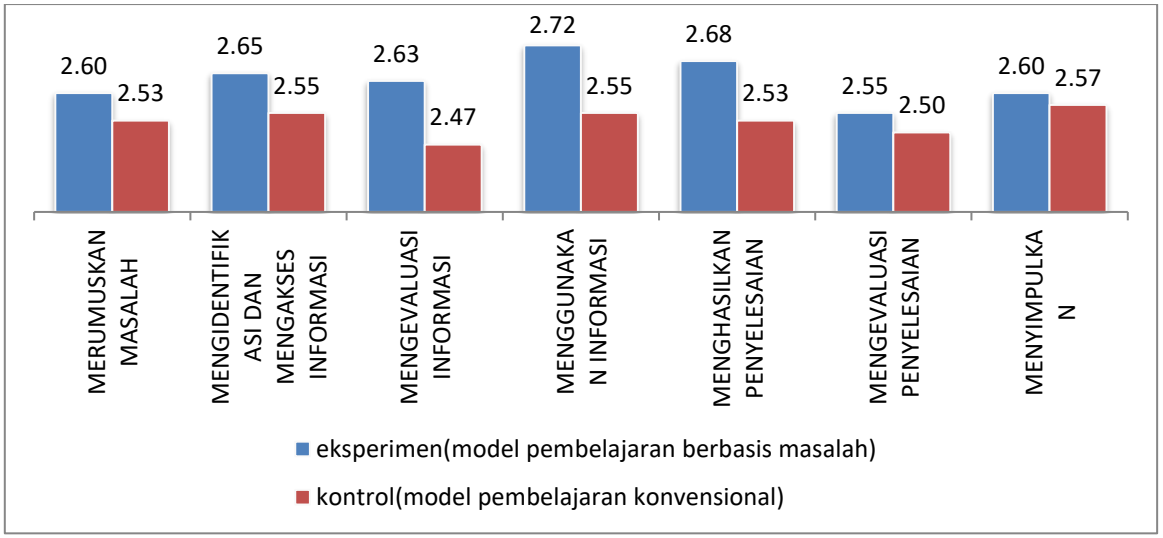

Figure 4: Comparison Diagram of Information Literacy Skills Posttest Results

Discussion

Based on the analysis between the 2 way N-Gain values, it was concluded that there is a difference between students in the experimental and control classes, where the $p - value = 0{,}000 < \alpha = 0{,}05$ therefore, H_{0A} is rejected. These results are consistent with the study carried out by Abdul Muttalib, which stated that problem-based learning models increase students' achievement in Islamic Education (Mutallib, 2014). This is also consistent with the studies carried out by Rina Widiana, Ade Dewi Maharani, and Rowdoh, which stated that the adoption of the problem-based learning model significantly improves the students' scientific literacy skills (Widiana, Maharani, and Rowdoh, 2020).

The measurement of the 2-way analysis of the different cells also shows a contrast in the students' information literacy skills in accordance with abstract and concrete random, as well as abstract and concrete sequential thinking patterns. This is consistent with the $p - value$ of thinking style on information literacy ability of $0{,}000$, which implies that $when\ it\ is\ < \alpha$, H_{0B} is rejected. These results are consistent with the study carried out by Muhammad Safei's which stated that there is a significant difference between abstract, and concrete random, as well as abstract and concrete sequential thinking styles in accordance with learning outcomes (Safei, 2019).

Furthermore, it is also evident that the $p - value = 0{,}188$, where $it\ is > \alpha$, it was however concluded that there is no existent relationship between the adopted learning model and the different thinking styles of each student on information literacy skills, therefore H_{0AB} is accepted.

Figure 4 shows that the average N-Gain value of students with an abstract sequential learning style in the experimental and control classes are 0.827, and 0.650 in the high and medium improvement categories, respectively. The average N-Gain value of students with a concrete sequential type learning style in the experimental and control classes are 0.677 and 0.498, respectively in the medium category. The average N-Gain value of students with a concrete random type learning style in the experimental and control classes is 0.507 and 0.472, in the medium category. The average N-Gain value for students with abstract random

type learning styles in the experimental and control classes are 0.496 and 0.350 in the medium category.

In terms of reading information the difference in the development of competencies in the experimental class is greater than the control due to the application of models that stimulates students to critically and actively solve given problems. The problem-based learning model mandates students to read and search for information, hence, they are accustomed to finding solutions to certain problems unconsciously. In addition, it enhances students' potentials to read and solve problems independently. The high improvement of students' information literacy competencies in the experimental class is also because they need to continuously solve problems drawing conclusions.

Figure 5 shows that the students taught with the problem-based learning model tend to master each indicator associated with the information literacy skills appropriately. This is because the stages of implementing learning based on solving problems increases students reading skills and ideas. According to Abidin, Mulyati, and Yuansah (2017), the aspect of explaining events needs to be properly memorized, in accordance with the knowledge obtained. In problem-based learning, students study by designing and developing solutions to problems(Perusso & Baaken, 2020). Furthermore, it empowers students to apply theoretical knowledge into practice (Barbieri et al., 2020). The problem-based learning model requires them to read a lot and seek information, however it unconsciously improves students curiosity on a particular lesson (Sanjaya, 2014). Marzuki & Basariah (2017) stated that the procedure for implementing problem-solving learning aids students in developing a systematic and logical mindset which facilitates the stipulated regulations.

Related to the analysis between the 2 ways of measuring different cells, the differentiation of students' thinking styles also influences information literacy skills. The concrete sequential thinking style is shows that the improvement in information literacy skills regarding each indicator is different. Furthermore, the graph used to improve students' information literacy skills is in accordance with the concrete sequential thinking style, as shown in Figure 5.

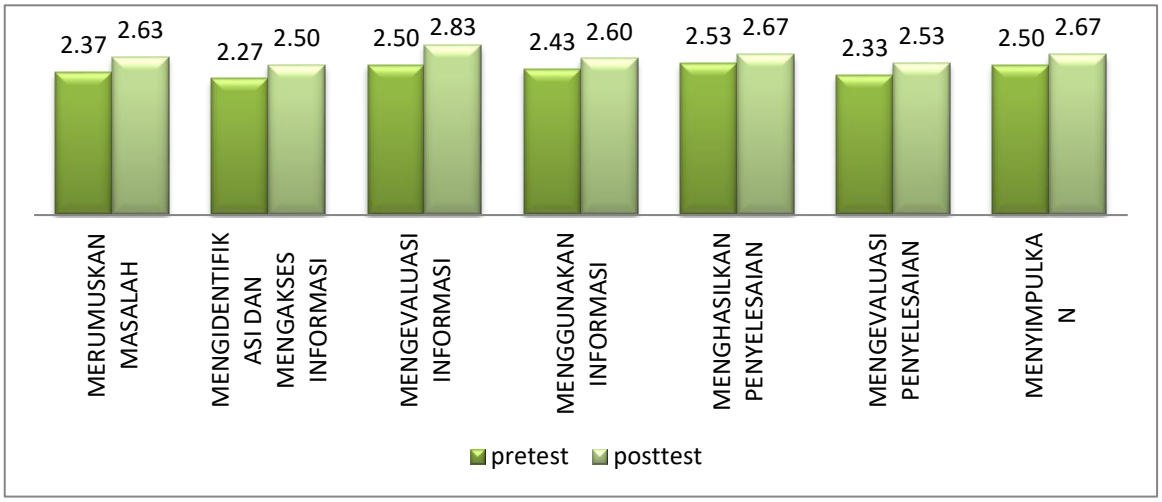

Figure 5: The Improvement of Information Literacy Skills with the Type of Concrete Sequential Thinking Style Per Indicator

Concrete Sequential (CS) thinkers are people that persistently believe in reality and systematically, sequentially, and linearly processed information. This aids them to evaluate

information and other indicators. They understand reality based on facts (Mahmud, 2010). CS thinkers believe that reality helps them analyze, translate, and relate the processed information (Sudjana, 2011). Therefore, the information literacy skills of students with a CS thinking style are higher than the others.

In contrast, the AS thinking style owner tends to understand things rationally, intellectually, and logically. The improvement of students' information literacy skills with the AS thinking style is shown in the following graph.

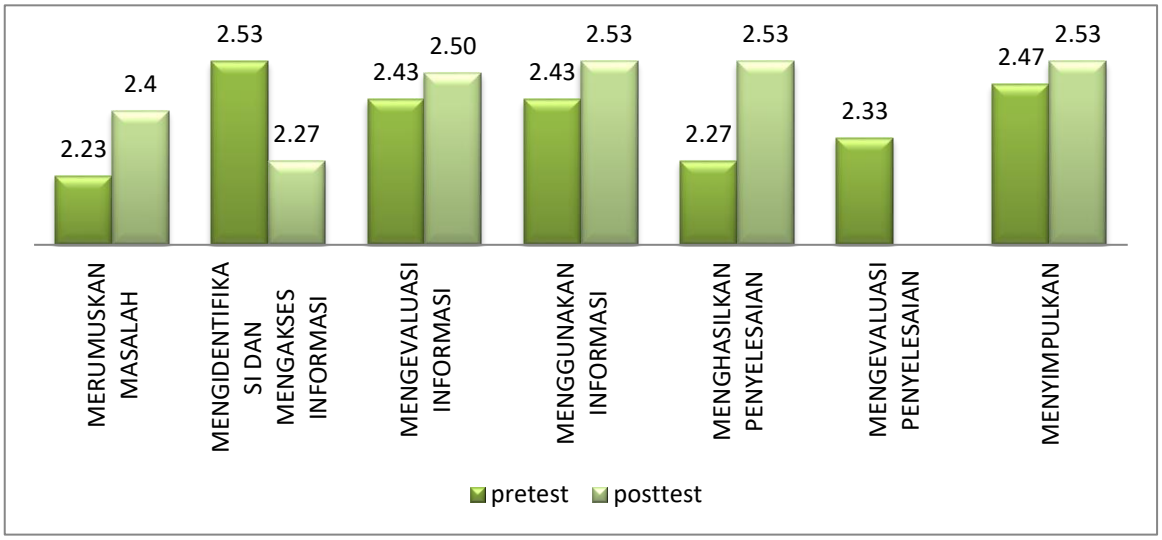

Figure 6: The Improvement of Information Literacy Skills with the Type of Abstract Sequential Thinking Style Per Indicator

Based on the graph in figure 6, the AS thinking style owner has exceptionally good identification skills. This is because they think about things that are either abstract or metaphysical in nature. Moreover, this is based on their intellectuality, rationality, and logic (Mahmud, 2010). People that think with AS prefer to analyze problems, thereby obtaining the appropriate solution.

Furthermore, comparing the 2 types of aforementioned thinking styles, random concrete thinkers possess lesser abilities than the abstract sequential ones. The improvement of students' information literacy skills with the concrete random thinking style is shown in the following graph.

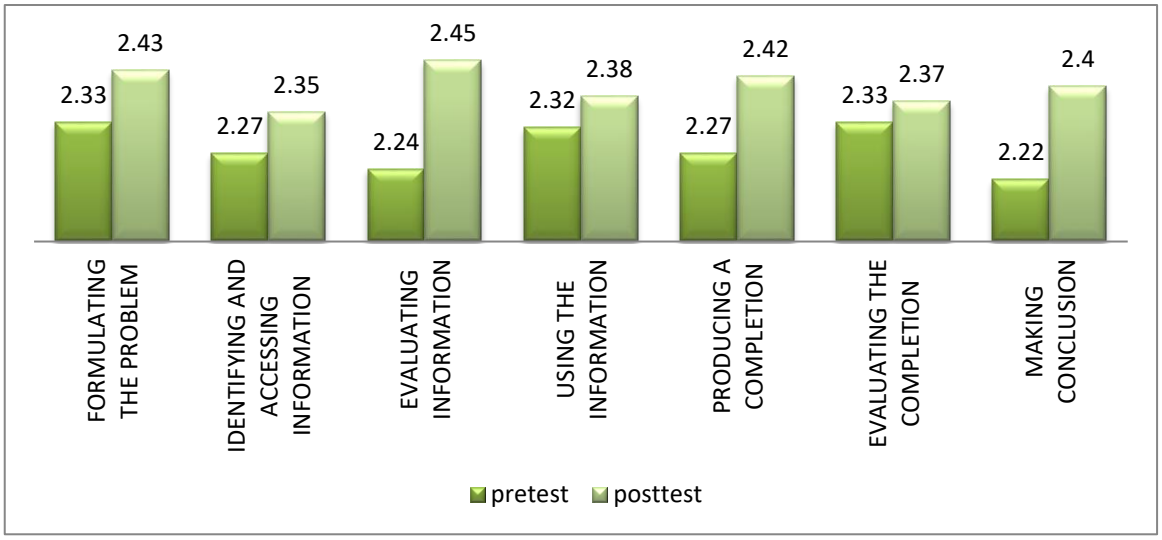

Figure 7: The improvement of Information Literacy Skills with the Type of Concrete Random Thinking Style per Indicator

The concrete random (CR) thinking style has similar characteristics as the concrete sequential, which is realistic. It is evident that there is a drastic improvement in the information literacy skills of students because CR thinkers are realistic, therefore they tend to be absolutely careful in evaluating any issue. Unfortunately, their way of thinking is not adequately structured, thereby causing them to acquire less optimal information, irrespective of the fact that they tend to solve certain problems by adopting the most appropriate method (Mahmud, 2010). They are always realistic in their thinking and understanding (Setyawan & Rahman, 2013).

However, among the other 3 types, owners of abstract random thinking styles possess minimal information literacy skills. The improvement of students' information literacy skills with the CR thinking style is shown in the following graph.

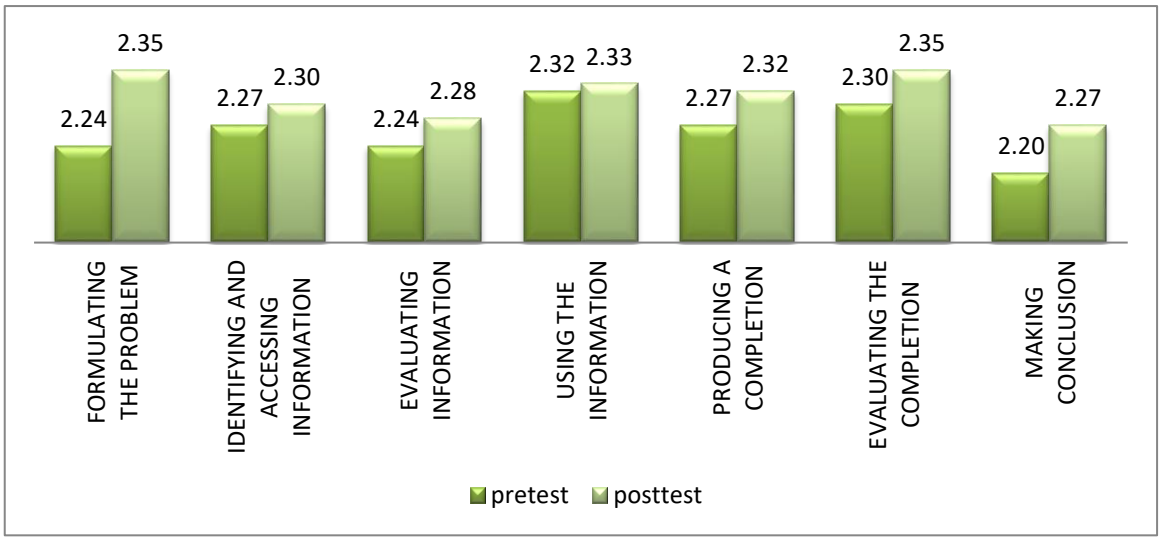

Figure 8: The Improvement of Information Literacy Skills with the Type of Abstract Random Thinking Style per Indicator

The information literacy skill with abstract random thinking style in each indicator is lesser than the others. This is because the CR thinking style owner holistically deals with reality. Therefore, it is important to generally understand a problem in the simplest form to

avoid difficulties in resolving issues that require regular solutions, such as literacy. However, CR thinkers tend to properly understand information and ideas, therefore, they are able to differentiate between the main and abstract issues (Sudjana, 2011).

CONCLUSION

Based on the data analysis previously described, the following were concluded. The learning model impacts improving students' information literacy competencies, with a *p-value* of 0.0000. The different thinking styles for improving students' information literacy skills have a *p-value* of 0.0000. There is an interaction between the different thinking styles and applying learning models to improve students' information literacy skills. The class of students that were given the treatment of the problem-based learning model had better information literacy skills on each indicator compared to those that were treated with the conventional method. The students with a concrete sequential thinking style experience a higher development of information literacy skills than those that possess abstract and concrete random, as well as abstract sequential thinking styles. Students with an abstract random thinking style have minimal information literacy skills than those that possess the other types.

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